

## **REMARKS**

Claims 1-6, 8-17, and 22-35 are pending in the Office Action, with claims 1, 9, 22, 30, 31, 32, and 34 being the independent claims. Applicants request that claims 1, 5, 9, 22, 26, and 27 be amended.

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 1-6, 8-17, and 22-35 in condition for allowance. The proposed amendments of claims 1, 5, 9, 22, 26, and 27 should not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships claimed were either earlier claimed or inherent in the claims as examined. Therefore, this Amendment should allow for immediate action by the Examiner.

Furthermore, Applicants respectfully point out that the Final Office Action by the Examiner presented some new arguments as to the application of the art against Applicants' invention. It is respectfully submitted that the entering of the Amendment would allow the Applicants to reply to the final rejections and place the application in condition for allowance.

Finally, even if the Office determines that the application is not in a condition for allowance, Applicants respectfully request that the amendments be entered to place the claims in a better condition for appeal.

### **Rejections under 35 U.S.C. § 103**

#### **Claims 1, 2, 4, 5, 8, 26, 28, 9, 10, 12-14, 17, 27, 29, 22-25, and 30-35**

Claims 1, 2, 4, 5, 8, 26, 28, 9, 10, 12-14, 17, 27, 29, 22-25, and 30-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No.

5,604,319 to Kohsaka et al. ("Kohsaka") in view of U.S. Patent No. 3,913,617 to van Laar et al. ("van Laar").

Applicants have narrowed the scope of claims 1 and 9 by removing one of the characteristic factors. Accordingly, after entry of this Amendment, claim 1 will be directed to a method of mixing dilution air and an exhaust gas, including at least one of the following characteristic factors: 1) providing walls of the mixing chamber with an absence of structure extending into the mixing chamber; 2) introducing the first and second streams of gas from the plurality of first stream passages and the second stream passage into the mixing chamber with a substantially well-developed flow; and 3) introducing at least one of the first and second streams of gas, as the exhaust gas, into the mixing chamber from more than one entrance port.

Kohsaka discloses that exhaust gas from an engine 1 is introduced into a dilution tunnel 3 via an exhaust pipe 2 (see Fig. 1), that air is drawn into the dilution tunnel 3 through an air filter 4, and that the diluted exhaust gas is then drawn through a venturi tube 6. See FIG. 1.

van Laar discloses a system for cooling a hot-blast flow with a cold air flow for a blast furnace. A first conduit 1 carries the hot-blast flow and a second conduit 2 carries the cold air flow. A ring main 3 and a plurality of pipe bends 4 connect the second conduit 2 to the first conduit 1. van Laar, column 2, line 62-column 3, line 4. In order to introduce the cold air flow into the hot-blast flow, the cold air is introduced into the first conduit, at a high velocity, perpendicular to the hot-blast flow, forcing the cold air deep into the hot-blast flow. See van Laar, column 2, lines 23-28 & 55-57. In order to further

increase the velocity of the cold air flow, the flow cross-section of the pipe bends or discharge openings may be reduced. See van Laar, column 3, lines 31-36.

The combination of Kohsaka and van Laar does not render any of the rejected claims unpatentable because the combination fails to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation to modify the reference or to combine reference teachings. The teaching or suggestion to make the claimed combination must be found in the prior art, and must not be based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). See MPEP § 2143.

The Office Action suggests combining Kohsaka and van Laar by modifying the exhaust pipe 2 of Kohsaka to include the ring main 3 and pipe bends 4 of van Laar and to terminate the modified exhaust pipe of Kohsaka at the wall of its dilution tunnel 3. However, Applicants respectfully submit that such a combination does not establish a *prima facie* case of obviousness because there is no teaching or suggestion in the art to modify Kohsaka and van Laar in the manner suggested.

As Applicants set forth in their Reply to Office Action on January 25, 2005, neither Kohsaka nor van Laar provides any suggestion or motivation to add the ring main and pipe bends of van Laar to the sides of the dilution tunnel of Kohsaka in order to introduce its exhaust stream at its wall. For the reasons described in the prior Reply to Office Action, van Laar teaches that when its cold air conduits terminate at the walls of the hot-blast flow conduit, the cold air is introduced at a high velocity to achieve proper mixing. On the other hand, Kohsaka would suggest that proper mixing is achieved by introducing the exhaust gas into the middle of its dilution tunnel, rather than

at the side of its dilution tunnel. These teachings together do not provide a suggestion or motivation to one skilled in the art to combine the teachings in a manner that renders the claims unpatentable because to replace Kohsaka's exhaust pipe with the cold air conduits of van Laar would require that the exhaust be introduced to the dilution tunnel at a high velocity to achieve proper mixing. And introducing the exhaust gas at a high velocity is unacceptable because it would increase the backpressure in the exhaust pipe, thereby affecting the emissions from the associated engine and skewing any results obtained from the emissions sampling device of Kohsaka. If combined as proposed, the emission sampling system of Kohsaka would become inoperable for its intended purpose because any test results would be skewed. Therefore, neither of these references provides a satisfactory suggestion or motivation to combine and modify them in a manner that would render the claims unpatentable.

The Office Action states that the above arguments were previously recognized, but that the Office Action is relying upon van Laar "expressly . . . for a very homogenous mixture." See Office Action, page 6. However, it is well established that any prior art reference must be considered in its entirety. See MPEP § 2143.02. Accordingly, disclosure of van Laar that leads away from the claimed invention must also be considered, including pressurizing what is allegedly the equivalent of Kohsaka's exhaust gas to achieve high velocities. Considering van Laar in its entirety requires that the Office also consider the reasons that one skilled in the art would be motivated to *not combine* the teachings of van Laar with the teachings of Kohsaka. And for the reasons set forth above, one skilled in the art would not be motivated to combine the teachings of Kohsaka and van Laar because van Laar teaches that to obtain good mixing, the air

must blow at high velocities. This would cause backpressure in the exhaust pipe and skew any sampling results taken with the system of Kohsaka. Because the system of Kohsaka would effectively become inoperable for its intended use, there is no suggestion or motivation to combine Kohsaka and van Laar. Therefore, the Office has not established a *prima facie* case of unpatentability and the rejected claims should be allowable. Applicants respectfully request that the Examiner withdraw the rejection and allow the claims.

#### Claims 25-27

Claims 25-27 depend from and add additional features to independent claims 1, 9, and 22. These claims recite directing the first and second gas streams in a manner that they avoid impinging on each other as they enter the mixing chamber. As explained in the Reply filed on January 25, 2005, avoiding impinging is meant to cover the situation where the gas flows are introduced into the mixing chamber in a direction where the gas stream of one gas does not directly cross the gas stream of the other gas. Such a system is disclosed in Figs. 2 and 3 of the present application, where the gas streams of each flow are introduced into the mixing chamber in the same direction. The gas streams do not cross each other, and therefore, they avoid impinging on each other as they enter the mixing chamber. It should be noted that even if Kohsaka and van Laar were properly combinable in the manner suggested in the Office Action, the features of claims 25-27 would not be taught or suggested because one gas stream would enter the mixing chamber directly through the path of the other gas stream. Accordingly, the two gas streams would be impinging. Applicants respectfully request that the Examiner withdraw the rejection of these claims.

### Claims 3, 6, and 15

The Office Action rejected claims 3, 6, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of U.S. Patent No. 5,090,258 to Yamasaki *et al.* ("Yamasaki"). Claims 3, 6, and 15 depend from and add additional features to independent claims 1 and 9. Therefore, these claims are allowable for at least the reasons discussed above. Applicants respectfully request that the Examiner withdraw the rejection of these claims.

### Claims 32-35

The Office Action rejected claims 32-35 under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of Yamasaki. Claims 32 and 34 are independent claims. The Office Action rejects claims 32-35 based on the same reasoning that the claims are unpatentable in view of Kohsaka and van Laar. For the reasons set forth above, there is no suggestion or motivation in the art to combine Kohsaka and van Laar in the manner taught in the Office Action.

In addition, the Office Action relies upon Yamasaki for the teaching of a flow rectifying plate, stating that such a plate effectively transmits dilution air into a mixer and also results in a well-developed flow of the dilution gas. See Office Action, page 4. The Office Action also states that the "plate straightens flow of dilution air passing there through, and results in a well developed gas stream . . . ." See Office Action page 6. Applicants respectfully submit that the flow rectifying plate taught in Yamasaki does not provide a well-developed flow stream, as recited in claims 32 and 34. The rectifying plate in Yamasaki is a thin plate that appears to have at least one passage there through. The passage size appears to have a width greater than its length. As

described in the Specification, a well-developed flow may arise in a long pipe if the flow is not subject to any protrusions, changes in cross-section, or other disturbances. Specification, paragraph 18. In Yamasaki, any passage through the flow rectifying plate, having a width greater than its length, is not a long pipe, as described. Therefore, the flow rectifier 13 is not developing a well-developed flow. There is no disclosure in Yamasaki of a well-developed flow because a “long pipe” is a pipe having more than a one-to-one length to width ratio.

Because Yamasaki does not teach or suggest a well-developed flow, the claims 32 and 34 should be allowable over the combination of Kohsaka, van Laar, and Yamasaki. Claims 33 and 35 depend from and add additional features to independent claims 32 and 34. Therefore, these claims should be allowable for at least the reasons discussed above. Applicants respectfully request that the Examiner reconsider and withdraw the rejection.

#### Claim 11

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kohsaka in view of van Laar and further in view of U.S. Patent No. 6,293,161 to Hanashiro et al. and in view of U.S. Patent No. 6,114,178 to Dezael et al. Claim 11 depends from and adds additional features to independent claim 9. Therefore, claim 11 is allowable for at least the reasons that claim 9 is allowable.

#### Double Patenting

Applicants acknowledge that claims 1, 3, 5, 9, and 15 stand rejected under the judicially created doctrine of double patenting over claim 4 of U.S. Patent No. 6,684,719. Accordingly, with this Amendment after Final, Applicants are submitting a

terminal disclaimer disclaiming the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term of prior Patent No. 6,684,719. Therefore, Applicants respectfully request that the double patenting rejection be withdrawn.

Conclusion

In view of the foregoing remarks, Applicants submit that this claimed invention is not rendered obvious in view of the prior art references cited against this application. Applicants therefore request the entry of this Amendment and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: May 16, 2005

By: 

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Attachment: Terminal Disclaimer